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BURIED DRUM REMOVAL PLAN

AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Approved w/ minor notes

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Montgomery Watson File No. 1252042

Prepared For:

ACS RD/RA Executive Committee

Prepared By:

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June 1997

MONTGOMERY WATSON

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AMERICAN CHEMICAL SERVICE, INC.
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Prepared For:

ACS RD/RA Executive Committee

Prepared by: _____ _____

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1.0 INTRODUCTION

This work plan has been developed at the request of the U.S. Environmental Protection Agency to guide the sampling, field characterization, laboratory analysis, transportation, and disposal of buried drum wastes currently buried in the On-Site Containment Area at the American Chemical Service, Inc. (ACS) NPL site (Site) facility in Griffith, Indiana. The buried drum removal will be conducted by Montgomery Watson and its subcontractors.

1.1 SITE BACKGROUND

The site is an active chemical manufacturing plant located at 420 South Colfax Avenue in Griffith, Indiana (Figure 1). The site began operations in 1955, with reclamation of spent solvent waste. The site accepted solvent mixtures containing alcohols, ketones, esters, chlorinateds, aromatics, aliphatics, and glycols which contained various residues. Other processes that have operated at the site since its inception include specialty chemical manufacturing in small batches, burning of still bottoms and non-reclaimable materials in incinerators (1965-1970), epoxidation and bromination operations, and storage and blending of waste streams for ACS's secondary fuel program.

During the mid-1960's, drums were buried at the ACS plant. Approximately 400 drums containing sludge and semi-solids of unknown types were reportedly disposed of inside the plant (this area was named the "On-Site Containment Area"). The approximate area of drum storage was a 250-foot by 450-foot parcel, located near the northern third of the fenced ACS facility. The drum storage area was apparent in a 1970 aerial photograph. However, an aerial photograph from 1973 indicates that the area was clear with no sign of drums on the ground surface.

During the remedial investigation conducted by Montgomery Watson in the late 1980s, a test pit was excavated in the area suspected to contain buried drums. The test pit was dug in an area that was mounded slightly above the flat ground surface characteristic of most of the ACS facility. The drums appeared to be buried on their sides and closely packed together. Various liquids were observed in soil surrounding the drums, such as brownish water, an oil-like liquid, and a viscous blue liquid leaking from several drums. The majority of the drums were noted to be dented, corroded, and/or mangled. Native soil was encountered at about five feet below the buried drums, or approximately 15 feet below ground surface.

Construction activities were conducted near the On-Site Containment Area earlier this year and buried drums were found in two locations. Drums were discovered, and 40 drums were subsequently removed during installation of the water line. The drums were overpacked and temporarily placed in a designated area of the Off-Site Containment Area. Buried drums were also encountered during a separate excavation associated with a barrier wall installation along the northern end of the facility. It was noted that some of the drums were packed on top of each other, up to three drums high. Based on past remedial

investigation results, and the more recent construction activities, a map outlining the approximate locations of the buried drums was created (Figure 2).

1.2 SCOPE OF WORK

The scope of work for the successful performance of the project involves execution of the following tasks:

- Preparation of this Buried Drum Removal Work Plan and revising as necessary to obtain Agency approval.
- Mobilization of qualified personnel, equipment, and materials.
- Site set-up, including the establishment of a temporary storage area, an exclusion zone and decontamination areas.
- Field characterization of drummed wastes.
- Sampling and documentation of buried drum wastes.
- Segregation of like wastes into disposal waste streams.
- Preparation and analysis of composite waste stream samples.
- Restoration of drum storage area.
- Temporary storage of excavated drums and drummed waste prior to treatment or disposal.
- Decontamination and demobilization of equipment
- Demobilization of personnel

These tasks will be initiated after drum sample results are received and after the results of the Material Handling and Low Temperature Thermal Treatment (MH/LTTT) pilot study have been evaluated.

- Preparation of a waste evaluation report discussing different waste management options.
- Preparation and submittal of TSDF acceptance paperwork, as necessary.
- Management of off-site transportation and disposal.

A detailed description of each of these major work tasks, plus site health and safety procedures, project organization, and other tasks required to successfully execute the buried drum removal are presented in the following sections.

2.0 PROJECT ORGANIZATION

Project operations and technical support will be provided by Montgomery Watson's project team. The organization for the project is presented as Figure 3.

Additional organizational members include the subcontractors required to complete the buried drum removal, which will be determined following approval of this Work Plan.

Samples collected from the buried drums for waste characterization purposes will be sent to one of the following designated laboratories for the ACS NPL Site. Both of these laboratories are certified in U.S. EPA CLP procedures:

IEA, Inc. Laboratory
3000 Weston Parkway
Cary, North Carolina 27513
Phone Number: 800-444-9919
Fax Number: 919-677-0427
Contact: Mike McFadden

Quanterra
13715 Rider Trail North
Earth City, MO 63045
Phone Number: 800-333-3305
Fax Number 314-298-8757
Contact: Dianne Mueller

3.0 SITE OPERATIONS

3.1 MOBILIZATION

Drum Removal Contractor will initially mobilize the following personnel to the Site to conduct the buried drum removal.

- Site Supervisor
- Project Chemist
- Equipment Operator (Subcontractor)
- Sample Technician (Subcontractor)

The Site Supervisor and the Health and Safety Officer will be regularly on site. A regional Health and Safety Manager will visit the site at the time of mobilization, and will serve on an as needed basis throughout the drum removal process.

The following equipment may be used to conduct the removal activities.

- Cyanide Monitox
- LEL/O2 Meter (MSA)
- Photoionization Detector
- Excavator
- Skid loader with Grappler Forks
- Cascade Air Supply System
- Sampling Supplies and Containers
- Health and Safety Equipment

If needed, additional equipment will be mobilized to the Site for grading and restoration purposes.

3.2 SET-UP

Once mobilization is complete, Drum Removal Contractor and its subcontractor(s) will set-up equipment and materials to support the removal activities. High visibility plastic fencing will be installed to delineate the exclusion and contamination reduction zones. The support zones will be established adjacent to the work zones. All breathing air systems and emergency equipment will be set up and tested.

3.3 DRUM MANAGEMENT

The buried drum removal project will be executed according to the procedures described below.

An exclusion zone will be established around the drum removal site. Personnel inside the exclusion zone will be in level "B" personnel protective equipment (PPE). Additional information regarding health and safety procedures during the removal project is presented in Section 5.0.

Adjacent to the excavation area, plastic sheeting will cover the ground surface to stage drum removal and initial inspection activities. The plastic sheeting will protect the surrounding area from spills. Soil around intact drums located in the excavation will be excavated and managed according to the existing Spoils Management Plan previously developed for the project.

As drums are uncovered and excavated, they will be field characterized and sampled according to the procedures outlined in Section 4.0.

Intact exposed drums will be removed from the excavation and temporarily stored in a polyethylene-lined, bermed storage area near the excavation. If the drum removal is performed during the cold weather season, excavation of the drums may occur in the frost layer of the soil requiring equipment to break the frozen soil around the drums. Excavation activities will be conducted to minimize damage to the drums, however some damage to the drums would be anticipated due to the frozen soil conditions.

For drums known to contain liquid and judged to be too fragile for temporary storage without rupturing, pumps will be utilized to remove the contents of the drum into a suitable bulk container with proper liner and containment. After the pumpable material in the drum is removed, the empty drum will be removed from the excavation/staging area and stockpiled on polyethylene for future disposal.

For drums known to contain solid material, and too fragile for temporary storage without rupturing, the excavation equipment will dig through the drum and drum contents, placing the material in a suitable bulk container with proper liner and containment.

In the event a drum ruptures during the removal or staging procedure, measures to contain the drum material release will be executed in accordance with the contingency plan described in Section 3.4.

"JULIE" ?

call Miss Dig? or equivalent to remark utility locations before-hand

It is likely that the drum removal activities will intercept existing subsurface utility line(s). In such a case, an evaluation will be made regarding whether the service line may be temporarily closed. If service can be closed, the section of the utility line(s) in the buried drum area will be removed and the utility line will be temporarily rerouted using a form of auxiliary piping (e.g., rubber hosing to continue a water line service). Otherwise, care will be taken to protect the service utility and Site workers during drum excavation and removal by using temporary shoring braces or other means to stabilize and/or isolate the utility.

The excavation activities will likely extend below the water table. As necessary, the groundwater will be removed from the excavation by using submersible pumps and discharged into the groundwater treatment system for treatment and eventual discharge.

After a drum has been field characterized and assigned a hazard class/waste stream (see Section 4), it will be staged with drums of similar waste and segregated from any incompatible wastes. Additional engineering controls such as berming between incompatible wastes, or providing separate bulk containers for such wastes will be implemented, as necessary. Drum movement and placement will occur using a skid loader with Grappler forks. Drums were discovered earlier this year in the On-Site Containment Area. They were overpacked, and temporarily staged in the off-site area. These drums will be consolidated with the drum removal activities for appropriate transportation and disposal.

After the drums are properly separated and staged in the temporary storage area, drum inspection, maintenance, and air monitoring of the drum area will occur on a weekly basis until the appropriate waste disposal method is determined. Information regarding transportation of the drums from the temporary storage area and final waste disposal options are presented in Section 5.0.

The personnel, equipment, and procedures for the drum management have been selected by Montgomery Watson to assure that site management of the drums occurs safely and efficiently.

3.4 CONTINGENCY PROCEDURES

In the event of a release, the first response will be to accurately determine the chemical and physical characteristics of the waste and volume involved. If small quantities (less than 30 gallons) are involved, neutralization of the waste will be attempted for acids and bases. Once neutralized, the material will be cleaned up and placed in an appropriate DOT container. Organic wastes will be adsorbed using Speedi-dry or similar material before containerization. Cyanides in wastes may be destroyed using bleach, if required. Based on the nature of the drum removal procedures, spills greater than 50 gallons are not anticipated. Spills that do occur will be contained within the drum removal excavation. Liquids will be collected from the excavation using chemically inert transfer pumps and placed into the proper container. Once contained and collected, the waste will be treated as another site waste stream for disposal. In the event greater than 30 gallons is spilled, the Project Coordinator and applicable State and Federal Agencies will be notified immediately.

3.5 REPORTING AND DISPOSAL

Once the analytical reports from the waste characterization sampling are received, Montgomery Watson will evaluate the results and generate a Waste Evaluation Report that outlines transportation and disposal options. The Waste Evaluation Report will be submitted to the Agency for approval. Additional details regarding transportation and

disposal of the drums, and contents of the Waste Evaluation Report are included in Section 5.

3.6 DEMOBILIZATION AND SITE RESTORATION

Once the drums have been removed and stored at a temporary location (refer to Figure 2), site restoration activities will commence. The drum removal area will be backfilled and/or graded using standard accepted practices to the approximate original contour of the area, assuring that pooling or severe erosion will be avoided.

Health and safety equipment including but not limited to air breathing systems, eyewashers and showers will be disassembled and removed from the Site following backfill of the excavation(s). The decontamination area will be dismantled and the decontamination water will be drummed for appropriate handling and disposal.

Delineating fencing and caution tape will be removed. The drum cell liners and associated debris will be placed into a roll-off container for disposal at a local non-hazardous landfill. Any unused or re-usable overpack drums will be staged for removal to a drum recycling facility.

4.0 SAMPLING AND ANALYSIS

Montgomery Watson has identified the following sampling and analytical tasks as necessary for the successful removal action at the Site.

- Sample collection and documentation of the contents of the drums
- Field hazardous categorization (hazcat) testing on waste samples collected
- Test blending of like waste streams to determine compatibility and generate composite waste samples for characterization
- Disposal analysis of the bulked waste stream samples

4.1 CONTAINERIZED WASTE SAMPLING

Samples of containerized waste will be conducted only after the container has been evaluated from a health and safety standpoint. Closed containers which appear bulged or under pressure will be remotely opened using a skid loader or excavator and non-sparking tools. Available previous records, initial drum removal data, container content labels, or manufacturer labels will be consulted before opening any container. Access to sample the drum will be made through the bung or other holes in the drum. If necessary, a non-sparking punch and hammer will be used to provide sampling access.

Initial container condition and physical waste descriptions will be conducted by the sampling team and recorded on a drum entry log.

Liquids

Liquids in drums will be sampled using four-foot sections of glass tubing or pipette (3 to 12 mm ID). The pipette will be slowly lowered into the drum. When the bottom of the drum is reached, the sampler will place a thumb over the end of the pipette and slowly retrieve it. Liquid or sludge layering in the drum should be apparent as the tube is brought up. The contents of the tube will then be released into a three-ounce sample bottle. The process will be repeated until a sufficient sample has been collected. Sludge or solids underneath a liquid may be sampled by forcing the pipette into it. If the sludge does not run out into the jar, shaking the pipette or tapping it against the side of the bottle may loosen the sample. If this fails, the pipette will be broken and the pieces which have the solid in them will be placed in the bottle.

Solid and Semi-Solid Wastes

Solid and semi-solid wastes in a drum will be sampled with a disposable inert sample scoop. The sample will then be transferred to a pre-cleaned clear glass eight-ounce wide-mouth sample container. If the material must be broken up prior to sampling, a brass hammer and chisel will be used. If the material is too elastic, a piece will be cut off with a razor knife. Reusable sampling tools will be decontaminated between drums.

4.2 FIELD HAZCAT ANALYSIS

Subsequent to the collection of discrete samples from each container, field hazcat testing for the initial waste hazards will occur, followed by a bench scale bulking exercise of chemically similar wastes. Drum Removal Contractor or their subcontractor will perform hazcat testing on each layer of every sample obtained, in order to separate and classify the material into compatible groups.

Following is an overview of the field test procedures employed for preliminary hazard identification of the site wastes.

- **Water Solubility** – The solubility of the sample in water is determined by adding one ml distilled/deionized (DI) water to one-gram sample, in a 12-mm x 100-mm culture tube. The contents are stirred using a vortex mixer.

- **pH** – The pH of the aqueous layer is determined using multi-colored indicating (or similar manufacturer) pH test strips.
  - Samples with a pH less than four are classified as acidic.
  - Samples with a pH greater than 10 are classified as basic.

- **Hexane Solubility** – The solubility of the sample in hexane/dichloromethane (50/50) is determined by adding one ml of 50/50 solution to a one gram sample and mixing. The hexane/DCM is prepared prior to the initiation of hazcat testing.
  - The sample is classified as organic if it exhibits the slightest solubility in hexane/DCM. This is to avoid organic material from contaminating an aqueous waste stream.

- **Flash Point** is normally determined for samples by a quantitative method. Quantitative results are obtained using a seta-flash apparatus. Qualitatively, samples are subjected to a propane flame source. Samples which spontaneously ignite and sustain a vigorous burn are classified as flammable.
  - Quantitatively, the apparatus is calibrated to determine those samples which have a flashpoint less than or equal to 60^0 C (140^0 F).
  - Samples which are positive are classified as flammable.

- **Chlorinated Compounds** are determined by the use of a Bilstein Flame test. The sample is placed within a loop of sterilized copper wire, and immersed into a flame.
  - A green flame is positive for chlorine.
  - A blue flame is indicative of bromine.

- **PCBs** – If the contents are oily, samples will be composited for analysis by the laboratory. Chlorinated organic liquids, or waste oils, are suspected of PCB contamination.
  - PCB screening is performed using a modified version of EPA/SW-846 Method 8080. Immunoassay ?
  - This procedure can be performed in the field by a qualified gas chromatograph operator, but is generally conducted off-site.
  - The detection limit for PCBs for each sample is 25 ppm.

- **Organic Peroxide** – The organic layer is tested for peroxides by placing a few drops of the sample on a peroxide test strip (commercially available).
  - A color change to blue is an indicator of an organic peroxide.
  - The concentration of peroxide can be quantified by comparison of the blue color to a color scale which accompanies the test strips.

- **Oxidizing Material** – The presence of an oxidizer is determined by the following procedures:
  - Acidifying the sample with glacial acetic acid.
  - A few drops of sample are placed on a potassium iodide-starch test paper.
  - A dark blue-black color formed within a few seconds is indicative of a strong oxidizer.
  - A light-blue color, or color formation which requires up to five minutes, is indicative of a weak oxidizer.

- **Sulfide Material** – The presence of sulfides in a sample is determined using a lead acetate test strip at pH-5. hydroxide ?
  - A few drops of 2M sodium buffer is added to the test strip and then a few drops of the sample are placed on the strip.
  - Formation of a black precipitate (lead sulfide) indicates a positive test for sulfides.
  - Confirmation of sulfides can be made with a cadmium carbonate solution. A yellow precipitate (cadmium sulfide) indicates a positive result.

- **Cyanide Material** – The presence of cyanide in a sample is detected by the use of commercially available cyanide test kits.
  - One-gram of sample is diluted to five-ml with DI water.
  - The pH is adjusted between seven and eight by the addition of a measured quantity of phosphate buffer. Dissolution of the buffer is enhanced by stirring on a Vortex mixer.

- Five drops of pyridine-barbituric acid is added.
- A test strip is immediately immersed into the solution for 30 seconds.
- A positive test for cyanides is indicated by a color change to red on the test strip reaction zone.
- The concentration of cyanide can be approximated upon comparison of the color of the reaction zone to color chart which accompanies the test strip kit.

4.3 BENCH SCALE WASTE BLENDING

Following characterization of the samples, a bench scale bulking test of chemically like samples will be conducted. The samples are bulk tested by slowly adding a small proportional aliquot from each sample proportional to the actual waste volume in the same classification group. Samples from the same compatible group will be bulked in not more than 25 samples per "bulk sample." This bulked composite sample from compatible samples will be submitted for disposal analysis. A five minute waiting period follows each addition, during which the bulked samples are monitored for any gas evolution or exothermic reaction. If a reaction occurs, the bulking test is repeated without the addition of the reactive portion of the sample. Upon completion of the bench scale bulk test, the compatible groups are identified.

By performing hazcat testing and bench scale bulking test, the amount of samples that require disposal analysis is reduced. This significantly lowers costs while providing an effective means of identifying material for disposal. These tests also provide information for performing on-site bulking of wastes for disposal.

4.4 WASTE DISPOSAL ANALYSIS

The data received from the compatibility analysis will be reviewed by the Site Supervisor who will determine the most suitable disposal analysis to be performed. This determination will be based on the most cost-effective and feasible method of disposal for each waste stream. The following table presents the standard lab analyses used for wastes based on the proposed disposal option.

GUIDELINES FOR DISPOSAL ANALYSIS	
Analysis	**Method(s)**
PACKAGE A [EACH WASTE STREAM]	
Total Solids	160.3
Corrosivity, pH	150.1, 9040, 9045
Flash Point Ignitability	1010, 1020
Reactive Sulfide	Section 7.3.4.1
Reactive Cyanide	Section y.3.3.2
TCLP Volatile Organics	1311-8240, 8260
TCLP Semi-Volatile Organics	1311-8270
TCLP Metals	1311-6010, 7000s
TCLP Pesticide/Herbicides	1311-8080/8150
TCL Volatile Organics	8240, 8260
TCL Semi-Volatile Organics	8270
TCL Pesticide/PCBs	8080
TCL Herbicides	8150
PACKAGE B [INCINERATION] Package A plus the following	
% Ash	160.4
BTU	ASTM
Total Halides	9020
Total Sulfur	ASTM
Total Cyanide	6010
TAL Metals and Molybdenum	6010, 7000s
PACKAGE C [LANDFILL DISPOSAL] Package A plus the following	
Paint Filter Test	9095
Total Cyanide	9010
Total Organic Halogens (TOX)	9020

All disposal analysis samples will be prepared and analyzed according to the methods shown above.

Advanced QA/QC samples will not be generated for the waste characterization samples. Data will be reported using the laboratory's standard deliverable package.

4.5 FIELD DOCUMENTATION

Sample integrity will be maintained through proper sample collection, documentation, and sampling equipment maintenance. Every sample collected will be labeled appropriately, and information will be printed neatly. After the sample is collected and the label is securely attached, the sample will be logged into the sample log book with the sample number written on the sample label.

Drum Removal Contractor will document and manage all data acquisition activities using standard database computer software, such as dBase IV, Foxpro, or Excel. A laptop computer will be used to log and track drums and samples in the field.

Following is a general discussion of the various documentation forms.

Sampling Documentation

Each drum sampled will be documented using the appropriate entry log. When using the field laptop, the information will be downloaded daily to the chemist's computer. The database software will then be used to generate the Drum Log.

Field Chemistry Documentation

The resulting field hazard characterization data will be entered into the computer by the Field Chemist. Upon characterizing and sorting like waste streams, the Field Chemist will generate the appropriate blending log to document all bench scale waste blending.

Sample Labels

Correct sample labeling and the corresponding notation of the sample ID numbers in the field logbook are necessary to prevent misidentification of samples and their eventual results. All sample labels will be filled out legibly and with indelible ink. They will be affixed to the sample container and covered with clear tape.

5.0 TRANSPORTATION AND DISPOSAL

Prior to removal of waste from the site, Drum Removal Contractor will adhere to all applicable federal, state, and local requirements. Drum Removal Contractor will only use those transporters and disposal facilities that are fully licensed and/or permitted. All waste will be properly staged and stored on site pending analytical data and acceptance approval.

Once the analytical reports from the waste characterization sampling are received, Montgomery Watson will evaluate the results and generate a waste evaluation report. Following approval of disposal facilities, Drum Removal Contractor will prepare waste profile sheets for generator review and signature, then forward the profile sheets to the designated disposal facility for acceptance approval.

5.1 WASTE EVALUATION REPORT

Based on aerial photographs and previous site investigations, approximately 400 drums containing sludge and semi-solids of unknown types were reportedly disposed of in the On-Site Containment Area. Once the waste characterization process is complete, and final volumes of identified waste steams has been calculated, Montgomery Watson will prepare a Waste Evaluation Report for review by U.S. EPA.

The Waste Evaluation Report will present information including the number of distinct waste streams identified on site, the approximate volume of each waste stream, and recommended disposal facilities that can process the waste stream.

In addition, the Waste Evaluation Report will present a cost evaluation discussion and presentation of different scenarios for the ultimate transportation and disposal of each waste stream. For example, it may be more cost effective to bulk, or combine some drummed solids into a roll-off container, or liquids into a tank truck for disposal even after the extra cost of on site labor to perform the bulking is considered.

5.2 SELECTION OF DISPOSAL FACILITIES

Disposal facilities will be selected on the basis of several factors:

- CERCLA compliance (applicable to RCRA wastes only)
- Acceptance by the Agency

- TSDF capacity to handle incoming waste
  - Volume
  - Turnaround time for approval to ship
  - Regulatory status

- Solicitation of bids

- Verification of permits and insurance (at time of event)

Potential disposal facilities to be used for this project are presented in the following table.

POTENTIAL DISPOSAL FACILITIES AND OPTIONS		
Facility and EPA ID Number	**Incineration**	**Landfill**
Laidlaw Environmental - Pecatonia, Illinois ILD 980502744		X
AETS Sauget, Illinois ILD 098642424	X	
Clean Harbors Chicago, Illinois ILD 000608471		X

5.3 DISPOSAL ARRANGEMENTS

The Project Supervisor will be responsible for ensuring all necessary paperwork required for approval at the selected disposal facility is completed. This paperwork includes, but is not limited to, waste profiles, analytical data, and generator certifications. These documents will be forwarded to the ACS PRP Committee for review and signature as generator.

The applicable agencies and the receiving state will be notified 14 days prior to shipment.

5.4 TRANSPORTATION

Drum Removal Contractor will verify that any haulers solicited on this project will have the proper waste permits for each waste they are transporting. All necessary shipping papers for the project will be completed and all vehicles and containers will be placarded and labeled correctly according to RCRA and DOT regulations. These shall include hazardous waste manifests, LDR certification, and bills of lading. Sample copies of each will be provided to the ACS PRP Committee at least forty-eight hours prior to the first shipment of any waste stream.

All final disposal facilities will be selected based on acceptability to the ACS PRP Committee and all applicable Agencies will be notified 14 days before shipment.

6.0 HEALTH AND SAFETY

Health and Safety will include air monitoring during initial entry and site excavation activities, perimeter air monitoring if so indicated by initial air monitoring results and/or site conditions, and on-site health and safety supervision of work activities by the SSO.

6.1 INITIAL SITE ENTRY

Initial Site entry will include workers donning Level B PPE, set-up of a decontamination area for PPE doffing following site entry and a site characterization and hazard evaluation, including air monitoring, to identify site hazards and their potential impact on worker and public safety.

Level B equipment includes: Tyvek coveralls with hood, latex overboots, 2 pair of latex or vinyl sample gloves (taped wrists, ankles, and hood), a Saranex-coated Tyvek outer suit, nitrile gloves (taped wrists), neoprene boots, a positive-pressure self-contained breathing apparatus (SCBA) and four or six point suspension hard-hat.

Direct reading air monitoring instruments, including a photoionization detector (PID), combustible gas monitor and a cyanide monotox (or equivalent), will be used to monitor the drum removal area during initial entry to identify conditions immediately dangerous to life and health (IDLH) and/or flammable atmospheres. Results of direct reading instruments can identify areas that require additional monitoring. Air monitoring using colormetric tubes will be used in follow-up entries if containers or vats indicate the evolution of gas or vapors (bubbling, foaming, or signs of container ballooning).

6.2 SAFETY PERSONNEL

Safety personnel will be available on site and by telephone to support initial site activities, and will provide additional on-site/off-site support throughout site activities.

Project Safety Officer

The Project Safety Officer (PSO) will be responsible for overseeing development of the HASP and will ensure that the HASP complies with all federal, state, and local health and safety requirements. The PSO provides technical and administrative support for the Montgomery Watson Health and Safety Program. If necessary, the PSO can modify specific aspects of the HASP to adjust for on-site changes that affect safety. The PSO will coordinate with the SSO on all modifications to the HASP and will be available for consultation when required. The PSO will not necessarily be on site during activities but may make periodic site visits to determine compliance.

Site Safety Officer
The SSO's primary responsibilities will be monitoring, including personal and environmental monitoring, conducting safety orientation, and reviewing site safety practices and documentation.

6.3 EQUIPMENT

The following equipment will be included for the initial response tasks:

- A Photoionization Detector
- A Combustible Gas Meter
- A Cyanide Monotox (or equivalent)
- Colormetric Tubes and Pump

6.4 TASK-SPECIFIC HEALTH AND SAFETY PLAN

The ACS NPL site has an existing Site Safety Plan (SSP) that documents the policies and procedures which protect workers and the public from potential hazards posed by work at the site. The SSP will be amended to include this section (Section 6) of the Buried Drum Removal Plan to incorporate the specific task of buried drum removal in the on-site area. Selected subcontractors will provide their own health and safety plans which will meet the requirements of Montgomery Watson's SSP.

The SSP procedures and guidelines are based upon the best available information at the time of the plan's preparation. Specific requirements will be revised as new information is received or when site conditions change.

All personnel entering the site shall read and sign the safety plan. It does not supersede any Federal, OSHA, state, or local regulations, but is in addition to them. In the event of a conflict between this plan and a regulation, the more stringent of the two will be enforced.

The SSP complies with all the requirements of 29 CFR 1910.120 regarding the conduct of hazardous waste operations, worker training, and medical surveillance.

Hazard Analysis
Prior to the start of each task a Hazard Analysis (HA) will be prepared by Montgomery Watson. This document will break down the task into steps and identify the potential hazards of each step and the precautions to be taken to ensure the safety of workers involved in that task. The HAs will be field checked by the PSO or SSO on an ongoing basis and revised as necessary. All revisions will be communicated to the work crew and training will be documented. The HAs are included in the following table.

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HAZARD ANALYSES	
POTENTIAL HAZARDS	**HAZARD CONTROL MEASURES**
SITE PREPARATION – EQUIPMENT/FACILITY SET-UP	
Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, vegetation, excavated material and debris • Mark, identify, or barricade other obstructions
Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
Sharp Objects	• Wear cut-resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures Manual
DEBRIS STAGING AND REMOVAL	
Struck By/Against Heavy Equipment	• Use reflective warning vests worn when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals
Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, vegetation, excavated material, and debris • Mark, identify, or barricade other obstructions
Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
Sharp Objects	• Wear cut-resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
Contact Dermatitis	• Wear PPE to avoid skin contact with contaminated soil, plants, or other skin irritants (See Section 5 HASP) • Identify and review poisonous plants with workers

HAZARD ANALYSES	
POTENTIAL HAZARDS	**HAZARD CONTROL MEASURES**
DEBRIS STAGING AND REMOVAL (continued)	
High Noise Levels	• Use hearing protection when exposed to excessive noise levels greater than 35 dBA over an 8-hour work period)
High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with Health and Safety Procedures Manual
DRUM AND CONTAINER HANDLING	
Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
Caught In/Between Moving Parts	• Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar motions • Assure guards are in place to protect from these parts of equipment during operation • Provide and use proper work gloves when the possibility of crush, pinch, or other injury may be caused by moving/stationary edges or objects • Maintain all equipment in a safe condition • Keep all guards in place during use • De-energize and locked-out machinery before maintenance or service
Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions
Fire/Explosion	• Eliminate sources of ignition from the work area • Prohibit smoking in work areas • Provide ABC (or equivalent) fire extinguishers for all work, flammable storage areas: fuel powered generators and compressors • Store flammable liquids in well-ventilated areas • Post "NO SMOKING" signs • Store combustible materials away from flammables • Store, all compressed gas cylinders upright, caps in place when not in use • Separate Flammables and Oxidizers by 20 feet minimum
Sharp Objects	• Wear cut-resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
Struck by, Against Heavy Equipment, Protruding Objects	• Use reflective warning vests worn when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals

HAZARD ANALYSES	
POTENTIAL HAZARDS	**HAZARD CONTROL MEASURES**
DRUM AND CONTAINER HANDLING (continued)	
Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present (See Section 5.0) • Review hazardous properties of site contaminants with workers before operations begin
High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with Health and Safety Procedures Manual
CONTAINER SAMPLING	
Sharp Objects	• Wear cut-resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large awkward loads
Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, vegetation, excavated material, and debris • Mark, identify, or barricade other obstructions
Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present (see Section 5.0) • Review hazardous properties of site contaminants with workers before operations begin
High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with Health and Safety Procedures Manual
LAB PACKING DRUMS	
Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, excavated material, and other debris • Mark, identify, or barricade other obstructions

HAZARD ANALYSES	
POTENTIAL HAZARDS	**HAZARD CONTROL MEASURES**
LAB PACKING DRUMS (continued)	
Fire/Explosion	• Eliminate sources of ignition from the work area • Smoking is prohibited • Provide ABC (or equivalent) fire extinguishers for all work and flammable storage areas, fuel powered generator and compressor locations • Store flammable liquids in well-ventilated areas • Post "NO SMOKING" signs + follow • Store combustible materials away from flammables • Store, all compressed gas cylinders upright, caps in place when not in use • Separate Flammables and Oxidizers by 20 feet minimum
Sharp Objects	• Wear cut-resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
Struck by, Against, Heavy Equipment, Protruding Objects, Splashes	• Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Wear hard hats, splash shields, and steel-toe safety boots • Understand and review hand signals
Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present (See Section 5.0)
High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with Health and Safety Procedures Manual
WASTE PUMPING AND TRANSFER	
Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present (See Section 5.0) • Review hazardous properties of site contaminants with workers before operations begin • Stay up-wind of bulking, chemical treatment activities
Fire/Explosion from mixing of incompatible materials; Ignition of flammable vapors	• Test atmospheres with combustible gas meter in areas where flammable materials are handled • Assure materials being bulked are compatible; assure hazcat data are accurate • Oxidizer and metal compounds are very reactive chemicals; it is recommended that these materials not be bulked when full analytical data is not available • Eliminate sources of ignition from the work area • Prohibit smoking • Provide ABC (or equivalent) fire extinguishers in all work and flammable storage areas • Store flammable liquids in well-ventilated areas • Post "NO SMOKING" signs • Store combustible materials away from flammables

HAZARD ANALYSES	
POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
WASTE PUMPING AND TRANSFER (continued)	
Fire/Explosion from mixing of incompatible materials; Ignition of flammable vapors (continued)	• Store al compressed gas cylinders upright, caps in place when not in use • Separate Flammables and Oxidizers by 20 feet
Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
Slips, Trips, Falls	• Clear walkways, work areas, of equipment, vegetation, excavated material, tools and debris • Mark, identify, or barricade other obstructions
Struck by, Against Heavy Equipment, Protruding Objects	• Use reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Barricade or enclose the waste bulking areas • Restrict entry to the work area to authorized personnel • Wear hard hats, safety glasses with side shields, and steel-toe safety boots

* Confined entry
or into pits
w/o shoring.

7.0 SCHEDULE

A detailed schedule will be developed after completion of the MH/LTTT study and approval of this Buried Drum Removal Plan by the U.S. EPA. In general, the progression of the major tasks will proceed as follows:

- Submit Buried Drum Removal Plan to Agency (June 19, 1997)
- Agency Reviews Buried Drum Removal Plan
- Revise Buried Drum Removal Plan in Accordance with U.S. EPA Comments
- Agency Approves Buried Drum Removal Plan
- Submit Final Buried Drum Removal Plan
- Complete MH/LTTT Study
- Conduct Buried Drum Removal from On-site Containment Area
- Prepare and Submit Waste Evaluation Report to Agency
- Agency Reviews Waste Evaluation Report and Provides Comments
- Revise Waste Evaluation Report
- Agency Approves Waste Evaluation Report
- Drums are Transported from the Site and Disposed of, According to the Waste Evaluation Report

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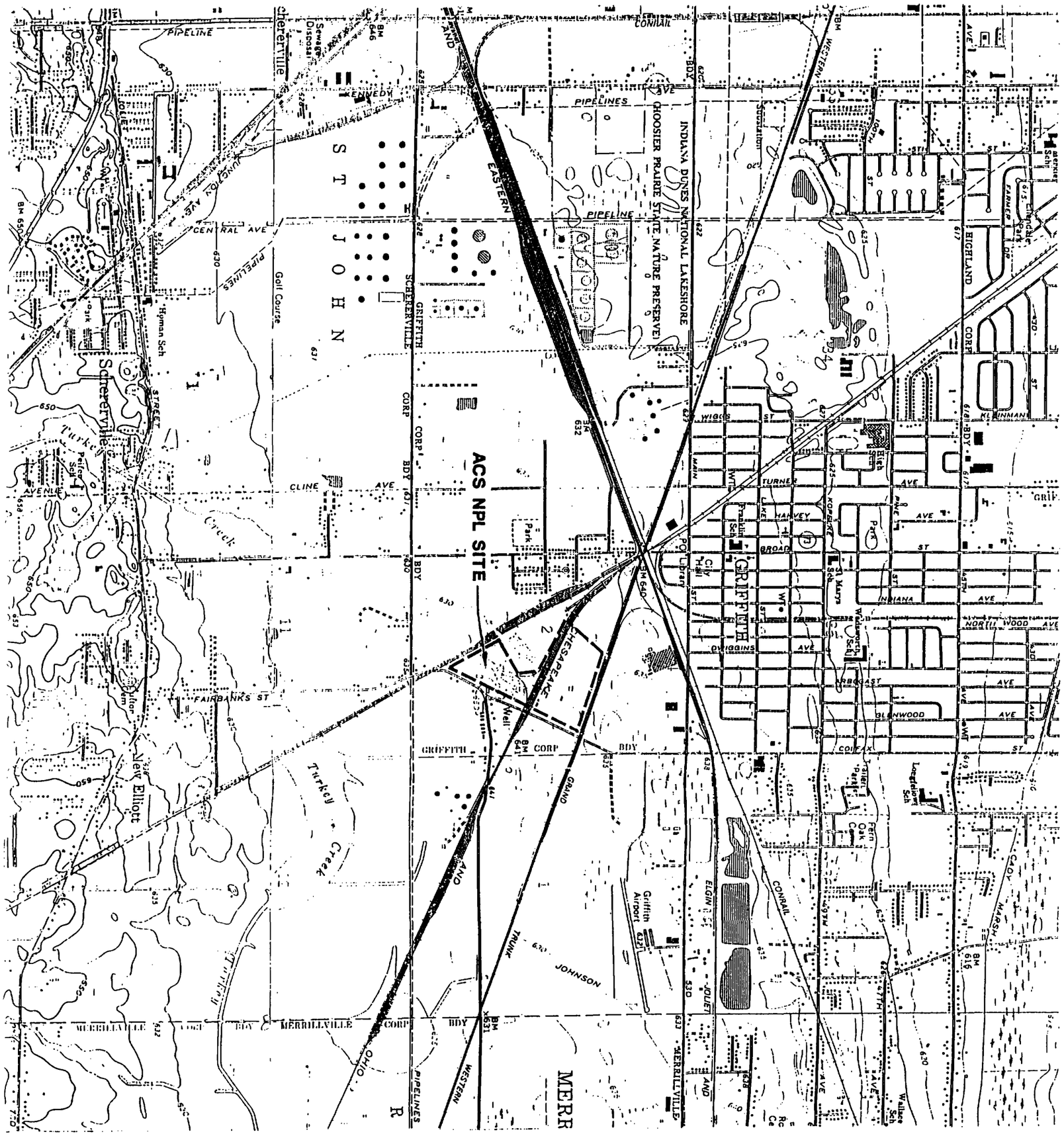
FIGURES

QUALITY CONTROL			
Graphic Standards		Technical Review	Management Review
Lead Professional		Project Manager	Other



NOTES

1. BASE MAP DEVELOPED FROM HIGHLAND AND ST. JOHN, INDIANA 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAPS DATED 1968 AND 1962 RESPECTIVELY, PHOTOREVISED 1980.

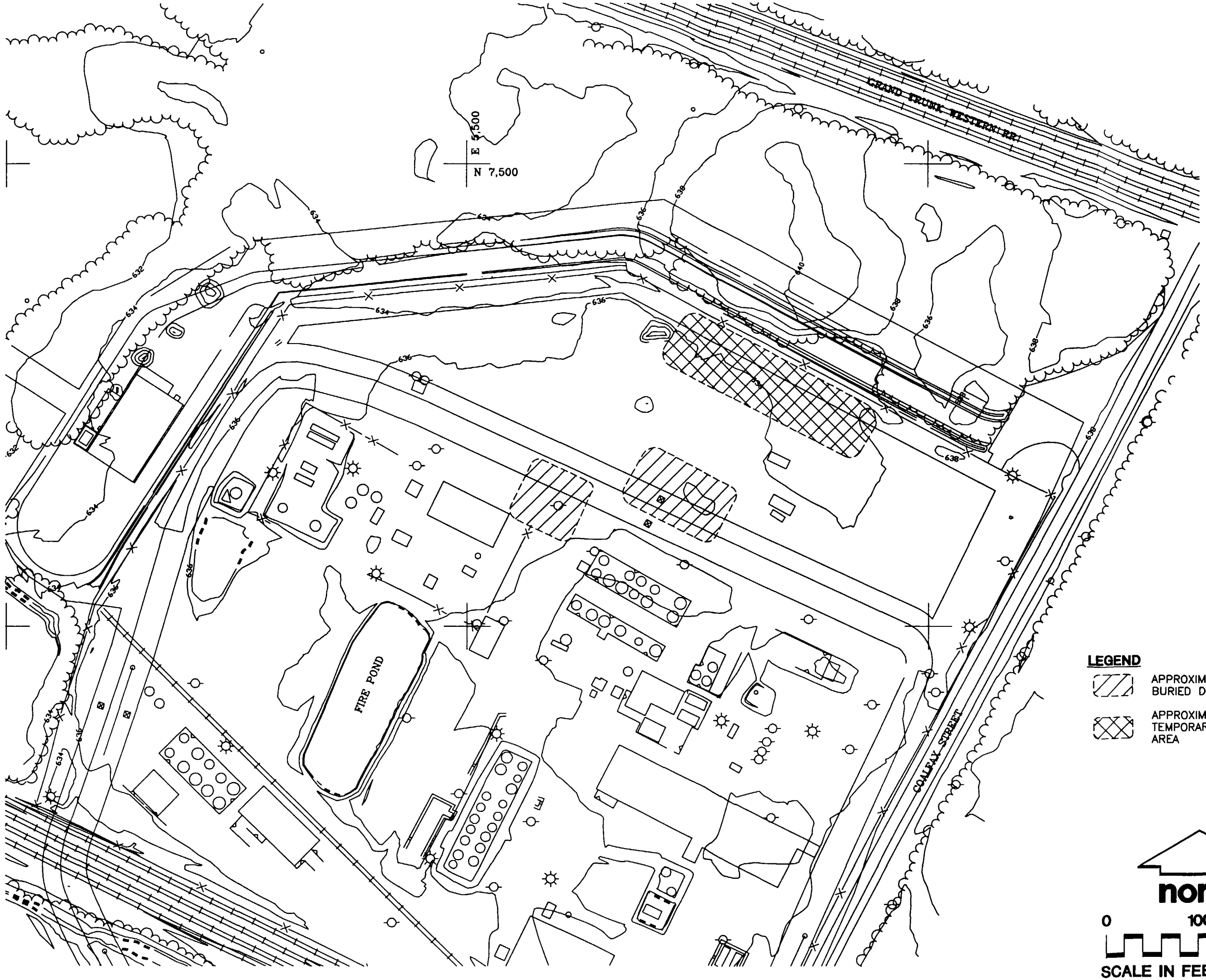
MONTGOMERY WATSON

Drawing Number 4077.0030 B1

SITE LOCATION MAP

DRUM REMOVAL PLAN
AMERICAN CHEMICAL SERVICE, INC.
GRIFFITH, INDIANA

Developed By	PMS, DAP	Drawn By	DLL, TMS, LCL
Approved By	M. Hamper	Date	2-6-95
Reference	MANUAL DRAWING 60251-B18		
Revisions			



LEGEND

APPROXIMATE LOCATION OF BURIED DRUMS

APPROXIMATE LOCATION OF TEMPORARY DRUM STORAGE AREA

north

0 100 200

SCALE IN FEET

FIGURE 2

BURIED DRUM LOCATIONS AND TEMPORARY STORAGE AREA

DRUM REMOVAL PLAN
AMERICAN CHEMICAL SERVICE, INC.
GRIFFITH, INDIANA

Drawing Number
1252042
211601 B3

MONTGOMERY WATSON

Developed By AC Drawn By CCM

Approved By Date

Reference

Revisions

QUALITY CONTROL

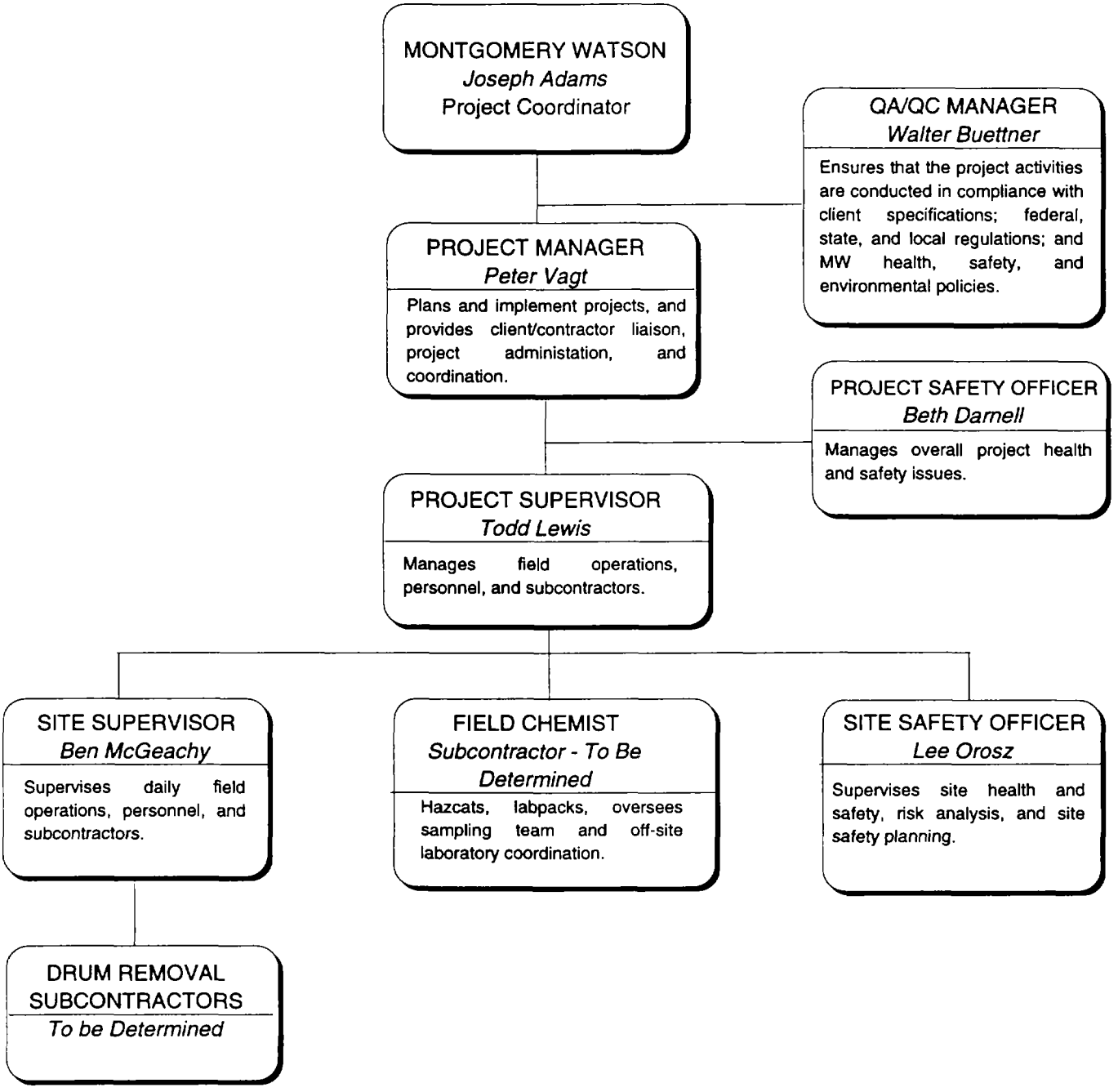
Graphic Standards CCM 6-10-97

Lead Professional

Project Manager Technical Review

Other Management Review

Figure 3
Organization Chart



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acc
6/13/97

MONTGOMERY WATSON

June 18, 1997

Ms. Sheri Bianchin, RPM
Mail Code SR-J6
U.S. EPA, Region V
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: Transmittal – Draft Drum Removal Work Plan
ACS NPL Site RD/RA
Griffith, Indiana

Dear Ms. Bianchin:

At you request, five copies of the draft Buried Drum Removal Work Plan are enclosed for your review. These are being provided to you within 30 days of receipt of the notification requiring the Work Plan in your May 15, 1997 letter (received by us on May 20, 1997).

Please don't hesitate to call if we can provide additional information on the draft Buried Drum Removal Work Plan.

Sincerely,

MONTGOMERY WATSON

Peter J. Vagt, Ph.D., CPG
Project Manager

cc: C. Brown, IDEM (2 copies)
S. Mrkvika, B&VWS (2 copies)
ACS Technical Committee

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